Electronic and Information Engineering Course	ID	025210
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Abstract

Title	Study on Methods of Object Pose Measurement

(800 words)

In manufacturing line, the determinations of geometrical object pose of products before robot manipulation is required and to reduce time while performing overall shape measurement. In order to perform it, the information of shape representation and matching of objects has become important. In general, image of objects are compared with its descriptor that conceptually subtracted from each other to form scalar metric. In theoretical consideration, if the shape feature which represents 1D information of the metric value is smaller, the object is considered closed to each others. Moreover, by rotating the object from static pose in some direction can introduce the change of value in scalar metric of boundary information after feature extraction of related object. Shape can be represented by boundary of edge image from the model of 3D object into 2D image. Alternatively, the classification of shape feature can be done to measure image intensity using contrast and correlation to evaluate the pose change. The indexing technique for retrieval shapes in order to measure 3D CAD object pose of 3D geometrical models based on similarity between boundary using object shape feature matching has been applied.

In this research we perform two different alternative methods in consideration. First is model based method. We used object feature points from center of gravity and we achieved 5 pixel error in measurement with this method. The later method is appearance based method. The subspace calculation by block digitalization of matrix represents a transformation into an image to another image which performs zero miss classification of the learning pose. The research ultimate goal is to develop a preprocessing algorithm for Computer Aided Testing (CAT) system. We have confirmed the both method's performance and it's considered useful as pose estimation for further curvature object application.